MONTHLY WEATHER REVIEW.

(GENERAL WEATHER SERVICE OF THE UNITED STATES.)

WASHINGTON, D. C., OCTOBER, 1882.

WAR DEPARTMENT,

OFFICE OF THE CHIEF SIGNAL OFFICER,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

INTRODUCTION.

This REVIEW presents a general summary of the meteorological data collected by the Signal Service during the month of October, 1882.

The most prominent meteorological feature of the month has been the tropical hurricane designated as number vi., on chart i., AREAS OF LOW BAROMETER. Great loss of life and damage to property occurred during its passage over Cuba. The cyclone lost much of its energy after leaving Cuba, and before reaching the coast of the United States. Early warnings of its approach were sent to all ports on the Atlantic and the Gulf of Mexico, and the number and value of the vessels detained in the different ports on account of the warnings are published in tabular form in connection with the description of the cyclone.

An additional chart has been prepared, designated as CHART SUPPLEMENTAL TO NUMBER I., and is issued with the REVIEW for this month; it shows the tracks of storm-centres on the Atlantic ocean, after they left the coast of America, as prepared from data received up to November 25th.

With the exception of this cyclone there have been no marked meteorological features during the month. But few local storms have occurred, none of them especially severe. The month has been mild and generally favorable to agricultural pursuits.

That part of the REVIEW referring to International Meteorology presents the general weather conditions which prevailed over the northern hemisphere during the month of August, 1880. The special features in the meteorology of that month were: the high temperature, above the normal, that prevailed over northwestern Europe; the increase of barometric pressure; and the deficiency in rainfall over the same district. Chart v. exhibits the paths of barometric minima for November, 1880. This chart exhibits the tracks of the two typhoons that occurred in the China sea during the month, and which were the last typhoons of the season of 1880.

In the preparation of this REVIEW, the following data, received up to November 20th, have been used; viz.: the regular tri-daily weather charts, containing the data of simultaneous observations taken at one hundred and thirty-six Signal Service stations and fifteen Canadian stations, as telegraphed to this office; one hundred and ninety-seven monthly journals, and one hundred and eighty monthly means from the former, and fifteen monthly means from the latter; two hundred and five monthly registers from voluntary observers; fifty-two monthly registers from United States Army Post Surgeons; Marine Records; International Simultaneous Observations; Marine Reports, through the co-operation of the "New York Herald Weather Service;" abstracts of Ships' Logs, furnished by the publishers of "The New York Maritime Register;" monthly reports from the local weather services of Indiana, Kansas, Nebraska, and Missouri, and of the Central Pacific railway company; trustworthy newspaper extracts; and special reports.

BAROMETRIC PRESSURE.

[Expressed in inches and hundredths.]

The mean barometric pressure for the month of October, 1882, over the United States and Canada, is shown by the isobarometric lines (in black) on chart ii. The region of highest mean-pressure is inclosed by the isobar of 30.1, and covers a narrow strip of country extending from New England southwestward to eastern Tennessee. Within this region the mean pressures are from 30.1 to 30.12, except on the summit of Mount Washington, where it is 30.17. Westward and southwestward of this high-pressure area the barometric means gradually decrease, and are lowest in the upper Missouri valley, the extreme northwest, and in the southern plateau. The lowest monthly means reported are: 29.84, 29.86, and 29.88 from Fort Bennett and Fort Buford, Dakota, and Saint Vincent, Minnesota, respectively. Two isobars of 29.9 appear upon the chart; one incloses parts of northern Minnesota, Dakota, and northeastern Montana, and the other, a small area in southwestern Arizona. West of the Rocky mountains the pressure is highest over the middle Pacific coast region, the highest monthly mean, 30.05, being reported from San Francisco, California.

Compared with the means of the previous month, there is an increase of pressure ranging from 0.01 to 0.13 at stations east of the eighty-second meridian. West of this meridian to the Rocky mountains, except at Denver and Pike's Peak, (where there is an increase of from 0.02 to 0.08,) the pressure is from 0.01 to 0.13 lower, the decrease being greatest in the upper lake region, the extreme northwest, and the upper Mississippi and Missouri valleys. The pressure is also lower in the north Pacific coast region and at a few stations in the northern and southern plateau districts. In the middle and south Pacific coast regions, and in the middle plateau, an increase, ranging from 0.02 to 0.14, occurs; it is most marked in the last-named district.

DEPARTURES FROM THE NORMAL VALUES FOR THE MONTH.

Compared with the October means of previous years the pressure is below the normal everywhere, except at a few of

the most northerly stations in New England and at Visalia, California, where it is slightly above. The greatest departures occur over the northern part of the country, west of the ninety-second meridian, where they range from 0.09 to 0.24. Marked departures occur also in the middle and southern slopes, where they range from 0.08 to 0.15. In other sections of the country, the departures are less noteworthy, and range generally from 0.01 to 0.10 below the normal.

BAROMETRIC RANGES.

On the Pacific coast, the ranges of pressure during the month have varied from 0.29 at San Diego, California, to 1.12 at Olympia, Washington territory. East of the Rocky mountains, the ranges have varied from 0.40 at Starkville, Mississippi, and 0.41 at Memphis, Tennessee, and Vicksburg, Mississippi, to 1.03 at Marquette, Michigan, and 1.08 at Saint Vincent, Minnesota. In the several districts the barometric ranges have been as follows:

New England: From 0.60 at Springfield, Massachusetts, to 0.99 at Eastport, Maine.

Middle Atlantic states: From 0.46 at Williamsport, Pennsylvania, and 0.51 at Lynchburg, Virginia, to 0.65 at New York City, and 0.69 at Chincoteague, Virginia.

South Atlantic states: From 0.49 at Atlanta, Georgia, to 0.74 at Charleston, South Carolina, and 0.85 at Savannah, Georgia.

Florida peninsula: From 0.44 at Key West and 0.45 at Cedar Keys to 0.52 at Punta Rassa.

East Gulf states: From 0.40 at Starkville, Mississippi, to 0.49 at Pensacola, Florida.

West Gulf states: From 0.46 at Port Eads, Louisiana, to 0.66 at Denison, Texas.

Rio Grande valley: From 0.63 at Uvalde, Texas, to 0.73 at Eagle Pass, Texas.

Ohio valley and Tennessee: From 0.41 at Memphis, Tennessee, and 0.42 at Nashville, Tennessee, to 0.67 at Champaign, Illinois.

Lower lake region: From 0.50 at Sandusky, Ohio, and 0.52 at Cleveland, Ohio, to 0.63 at Oswego, New York, and 0.64 at Rochester, New York.

Upper lake region: From 0.62 at Port Huron, Michigan, to 0.98 at Escanaba, Michigan, and 1.03 at Marquette, Michigan.

Extreme northwest: From 0.85 at Bismarck, Dakota, and 0.86 at Moorhead, Minnesota, to 1.08 at Saint Vincent, Minnesota.

Northern slope: From 0.68 at Fort Maginnis, Montana, and Fort Washakie, Wyoming, to 0.98 at North Platte, Nebraska.

Middle slope: From 0.70 on the summit of Pike's Peak, Colorado, and 0.74 at Fort Elliott, Texas, to 0.97 at West Las Animas, Colorado.

Southern slope: From 0.59 at Coleman City, Texas, to 0.74 at Henrietta, Texas, and Fort Sill, Indian territory.

Southern plateau: From 0.39 at Fort Grant, Arizona, to 0.58 at Santa Fé, New Mexico, and 0.65 at El Paso, Texas.

Middle plateau: From 0.62 at Pioche, Nevada, to 0.75 at Salt Lake City, Utah.

Northern plateau: From 0.75 at Boisé City, Idaho, and 0.76 at Eagle Rock, Idaho, to 0.99 at Dayton, Washington Territory, and 1.04 at Umatilla, Oregon.

North Pacific coast region: From 0.95 at Roseburg, Oregon, to 1.12 at Olympia, Washington Territory.

Middle Pacific coast region: From 0.48 at Sacramento, California, and 0.52 at San Francisco, California, to 0.76 at Cape Mendocino, California.

South Pacific coast region: From 0.23 at Los Angeles, California, to 0.47 at Visalia, California, and 0.49 at Yuma, Arizona.

AREAS OF HIGH-PRESSURE.

The following may be given as the general movement of areas of high barometer during the month. Six areas only are regarded as of sufficient importance to merit description. The most extensive area is number iv: During its progress across the country, frost occurred in nearly every district.

I.—This area is the same as number x. of the September REVIEW. On the morning of the 1st, the pressure had increased over the Mississippi valley and the lake region. At the same time, areas of low-pressure existed in the extreme northwest and off Nova Scotia. On the 2d, this area moved toward the east, the centre being in the British provinces. On the morning of the 3d, the barometer stood above the mean in New England, the middle Atlantic states, the Ohio valley and Tennessee, and the lake region, while the centre continued its easterly movement and passed into the Atlantic during the evening of the 3d; the whole area, however, did not leave the coast until the 7th. The pressure, after the passage of the centre, remained above the normal in all districts east of the Mississippi river, and finally disappeared on the 7th. The highest pressure observed was 30.43, in Manitoba, on the 1st.

II.—This area appeared first off the Oregon coast on the afternoon of the 8th. The pressure increased a good deal as it moved toward the east. At the time of its appearance, an area of low barometer was central over the upper lake region. On the morning of the 9th, the centre of the area of high-pressure was in Montana, and the barometer had risen over the country from western Montana to the Mississippi river. During the evening of the 9th, the hurricane noted as number vi. of areas of low barometer was just entering the Gulf states, the pressure at this time being greatest in Dakota. As the hurricane progressed, the area of high barometer moved rapidly to the east. On the morning of the 10th, the centre of this area was at Duluth, Minnesota; on the 11th it was at Montreal, Canada; on the 12th, at Chatham, and it passed into the Atlantic by the morning of the 13th. In connection with the passage of this area across the country, killing frosts occurred in Dakota. The highest pressure observed was 30.43, at Chatham, New Brunswick, on the 12th.

III.—This area, which was of small extent, appeared on the evening of the 12th, in New Mexico. Its course was nearly northeast, and it passed into the Atlantic on the 17th. The highest pressure observed was 30.26, at Pittsburgh, Pennsylvania, on the 15th, and at Father Point, Canada, on the 16th.

IV.—On the afternoon of the 14th, the barometer rose above the normal in California. On the morning of the 15th, the line of equal pressure embraced Oregon on the north and Utah on the east, while the pressure increased in California more than 0.10 inch. On the 16th, the centre of this area came within the limits of observation, and was in Oregon, where the barometer rose more than 0.20 inch. This area was of great extent. On the morning of the 18th, the pressure was a good deal above the normal over the whole country, between the Alleghany and Sierra Nevada mountains. Its movement was easterly, and it passed into the Atlantic on the 22d. Frost occurred during its progress in the Mississippi and the Missouri valleys, in Texas, the lake region, in Canada, the Ohio valley and Tennessee, New England, and the middle Atlantic states. The highest pressure observed was 30.49, at Chatham, New Brunswick, on the 22d.

V.—This area made its appearance in Oregon on the 20th; it pursued a southeasterly course, and passed into the Atlantic, on the 25th. Frost occurred in Oregon, Montana, Michigan, Tennessee, Ohio, and North Carolina. The highest pressure observed was 30.35, at Portland, Oregon, on the 20th.

VI.—On the morning of the 24th, the pressure was above the normal in Washington Territory. By the 25th, the area had moved easterly and its centre was in Montana. On the 26th, it moved to the northern part of the Mississippi valley. The greatest rise in barometer, on the 29th, was in the New England states. This area finally passed into the Atlantic. on the 29th. The movement was nearly due east. The highest pressure observed was 30.40, at Sidney, Nova Scotia.

AREAS OF LOW BAROMETER.

During the month there have been thirteen distinct areas of low-pressure, the centres of which have been defined sufficiently to permit of the charting of their tracks.

With the exception of numbers v. and vi., no centre has been marked by severe storms. During the progress of No. v., the wind

reached a velocity of more than twenty-five miles at all stations on Lake Michigan.

Number vi. is the tropical hurricane first noted to the west of Grand Cayman Island. The centre passed over the western part of Cuba, destroying life and property, and entered the United States on the afternoon of the 12th, on the western coast of Florida.

The following table gives the latitude and longitude in which each area was first and last observed, and the average hourly velocity:

Areas of low barometer.	First Observed.		Last Observed.		Average velocity in miles per hour.
	Lat. N.	Long. W.	Lat. N.	Long. W.	
	° ′	° ′	° ′	° ′	
No. I.	41 00	65 00	45 00	60 00	17.3
II.	39 30	117 00	47 00	101 00	31.3
III.	42 30	118 00	52 30	94 30	14.2
IV.	43 30	100 00	50 00	93 00	23.3
V.	42 00	93 00	49 30	60 30	35.7
VI.	19 00	82 30	34 30	74 00	14.0
VII.	43 30	101 00	49 30	76 30	36.9
VIII.	39 30	104 00	50 30	93 00	29.5
IX.	52 30	104 00	50 30	86 00	33.9
X.	45 30	98 30	48 00	79 30	29.0
XI.	50 00	103 30	47 30	78 00	33.5
XII.	50 00	126 30	50 00	66 30	34.2
XIII.	48 30	108 30	51 00	63 30	27.3

The following table gives the number of areas of low-pressure during the month of October, since 1873:

Year.	No.	Hourly velocity.	Year.	No.	Hourly velocity.
1873	13	—	1878	13	19.6
1874	9	—	1879	9	30.8
1875	10	—	1880	12	22.3
1876	9	27.7	1881	6	43.5
1877	11	20.2	1882	13	27.7

I.—This depression, of small extent, formed in the Atlantic ocean near where the centre is first located, or it is a cyclone recurving before reaching the coast of the United States, and moving with diminished energy. There are no data showing its existence before the 1st. On the morning of this date the centre was nearly south of Nova Scotia; at midnight it was east of Halifax; on the morning of the 2d, it was east of Sidney, after which it moved to the northeast, and passed beyond the limits of observations. The lowest pressure observed was 29.61, at Halifax, on the 1st. Heavy rains occurred in Nova Scotia during its passage.

II.—At midnight of the 1st, a depression of three tenths below the normal appeared in Nevada. On the morning of the 2d, it had moved to the northeast, and was central north of Salt Lake City. On the 3d, the centre was north of Bismarck, Dakota, and passed into British America, pursuing a northeast course. Rain occurred during its passage in Idaho, Montana, Dakota, and in the Missouri and Mississippi valleys. The lowest pressure observed was 29.71, on the 3d, at Moorhead, Minnesota. The wind reached a velocity of forty miles per hour, at Duluth, Minnesota, but of not more than twelve miles at all other stations in the Lake region.

III.—This depression was formed in the northern part of Nevada, and made its appearance at midnight of the 3d. On the morning of the 4th, the centre was in eastern Idaho, having moved in a northeasterly direction. On the 5th, it was north of Montana, and passed that day beyond the limits of the chart. It was accompanied by a slight rainfall in the extreme northwest.

IV.—This slight depression formed in southern Dakota, on the 6th; moved in a north-northeast direction, and passed into British America, on the 7th.

V.—On the morning of the 8th, the pressure in Iowa stood four-tenths below the normal. The centre moved to the northeast, passing over Michigan and Lake Superior, and finally passed beyond the limits of the chart, on the 9th. Rain occurred in the Missouri and Mississippi valleys, in the Ohio valley and Tennessee, and in the lake region. The wind reached a velocity of more than twenty-five miles per hour at Milwaukee, Wisconsin; Chicago, Illinois; Escanaba, Alpena, Marquette, and Grand Haven, Michigan.

VI.—The earliest information relative to this hurricane came from scattering vessel reports. From these it appeared that an atmospheric disturbance was present in the Caribbean sea, from the 5th to the 7th, but the data are too meagre to admit of a definite location of the centre.

From reports at hand the cyclone does not appear to have exhibited much energy until the 8th, when it was central south of Cuba. On that day the bark "Tamora," off the south coast of Cuba, experienced a hurricane, in which she lost several spars and nearly all her sails. On the same day the bark "Sadie" was abandoned, during the hurricane, about thirty miles northwest of Grand Cayman Island.

The centre passed to the westward of Jamaica, at too great a distance to exert any influence over the island, beyond a slight fall in pressure, and rainy weather. From the 6th to the 8th, there was a steady decrease of pressure at Havana, Cuba, with cloudy, rainy weather, and with moderate easterly winds.

It was not till the morning of the 8th that definite information was received at this office relative to the cyclone. It was determined that the centre was then to the southeast of Havana, near Grand Cayman Island.

The following telegram was at once sent to the stations in the Gulf states, and signals were ordered:

"A cyclone is now central south of Havana, moving toward the Gulf. Dangerous storms in the Gulf within next three days. Not safe for vessels to leave port until further notice."

On the 8th, the diameter of the cyclone greatly increased, and its presence was felt over the whole Island of Cuba and westward to the coast of Yucatan and the Gulf of Mexico.

By the morning of the 9th, the centre was passing over the western part of Cuba, and the destruction to life and property was very great.

At Pinar del Rio, Cuba, about one hundred and ten miles sw. of Havana, Cuba, its violence was first felt at 2 p. m. of the 8th, when the wind increased to a hurricane force, accompanied by torrents of rain. At 7.15 p. m. there was a sudden calm, which lasted about fifteen minutes, the barometer being stationary at 29.79. The storm vortex was then directly over Pinar del Rio. After the vortex had passed, the wind regained its violence for a few minutes, then fell slowly until 5 a. m. of the 9th, when it shifted to southwest, and the weather cleared. Reports show that the greatest destruction occurred in the Vuelta Abajo (the western tobacco region of the island.) The town of Pinar del Rio was almost destroyed. At Consolacion del Sur, Cuba, 75 per cent of the houses were demolished, and at Majaqua Galvez, Pilotos, Ceja de Luna Vinales, Cuba, and other places, the damage was equally great. Thirty-six bodies were found in the vicinity of Consolacion del Sur, and many persons are missing.

At San Juan and Martinez, Cuba, 1,500 warehouses and dwellings were destroyed; in the Hacienda del Valle, Cuba, three hundred houses were ruined. Most of the houses in the township of San Luis, Cuba, were swept away, and thousands of cattle were drowned. In the district of Guane, Cuba, it is estimated that 2,000 houses and tobacco storage buildings were laid in ruins. Mr. C. Hasselbrink, the Signal Service observer at Havana, reported that, during the heavier squalls and gusts from 1 to 2 a. m. of the 9th, a curious phenomenon was observed; the noise of the wind was excessive, and sounded as if everything would be torn down, but no great force was felt; doors and windows were scarcely shaken, and not a branch of a tree was broken; the wind must have been strong at a high elevation.

The following reports, furnished by the Rev. Benito Vines, S. J., Belen College, Havana, are given.

Meteorological observations relative to the hurricane of October 8, 1882, taken at the plantation "Casualidad," (Traironas,) situated about six miles south of Pinar del Rio, Cuba:

Day.	Hour.	Barometer (aneroid).	Thermometer.	Wind.	Force.	Remarks.
			°		(0–10)	
Oct. 6...	10.00 p. m.	29.88	72.5	nne.	5	Misty.
7...	6.00 a. m.	29.82	69.8	ne.	5	Misty; threatening.
7...	11.00 a. m.	29.80	73.4	ne.	5	Squally; very sullen and gloomy.
7...	3.00 p. m.	29.72	71.6	ne.	5	Do.
7...	10.00 p. m.	29.72	69.8	ene.	8	Squally; horizon covered.
7...	Midnight.	29.71	69.8	ene.	8	Squally; violent gusts from the 1st quadrant.
8...	4.00 a. m.	29.65	68.0	e.	9	Steady squalls; violent gusts from ne.
8...	10.00 a. m.	29.61	.....	ese.	10	Heavy showers; violent gusts from ne.
8...	12.00 m.	29.54	.....	e.	10	Do.
8...	2.00 p. m.	29.37	.....	se.	10	Do.
8...	3.30 p. m.	29.18	68.4	se.	10	Great damage; the sky assumed a leaden color, and the gusts became less strong from ne.
8...	5.00 p. m.	29.13	68.0	se.	10	Trees fell like leaves; stronger gusts from ne.; heavy showers.
8...	6.30 p. m.	29.02	68.0	se.	10	Trees fell like leaves; increased damage.
8...	7.15 p. m.	28.79	68.0	se.	10	Gusts raged with the greatest intensity from ene.; the force of the wind is indescribable; this looked like the end of the world; from 7.15 to 7.30 p. m., more or less calm, (vortex); lightning without thunder; everything illuminated.
8...	7.30 p. m.	28.79	68.0	se.	10	Terrible gusts, without precipitation.
8...	10.00 p. m.	29.13	68.0	se.	9	Dry.
8...	Midnight.	29.21	68.0	se.¼s	8	Do.
9...	1.00 a. m.	29.40	68.0	se.¼s	8	Dry; clearing; the stars visible.
9...	3.00 a. m.	29.51	68.0	ssw.	7	At intervals misty.
9...	4.30 a. m.	29.54	68.0	ssw.	6	Do.
9...	5.00 a. m.	29.58	68.0	sw.	5	Clear.
9...	11.00 p. m.	29.84	71.6	sw.	2	Do.

Extract of observations taken by Captain José Lleonard, of the steamer "Cristobal Colon," in the Colona river, Cuba, during the 7th, 8th, and 9th of October, 1882:

Day.	Time.	Barometer.	Thermometer.	Wind.	Force.	Remarks.
			°			
Oct. 7...	6.00 a. m.	29.98	78.8	ese. to e.	5	One-half covered; darkening in sse.
7...	Noon.....	29.98	84.2	ese. to e.	.....	Steamer cast anchor at the anchorage of Batabano.
7...	3.00 p. m.	29.92	84.2	e.	5	Cirrus clouds, diverging; dark in se.
7...	5.00 p. m.	29.92	84.2	e.	5	This was the regular hour for departure, and steamer sailed from the river Colona.
7...	7.00 p. m.	29.92	82.4	e.	5	Clear in w. and nw., rest of horizon dark.
7...	11.40 p. m.	.....	.....	e.	5	Light squall with light rain, the force of the wind increased; after the squall passed, the wind relaxed, but the obscurity increased.
8...	4.30 a. m.	29.86	78.8	e.	5	Threatening and raining near the horizon.
8...	6.00 a. m.	29.86	78.8	e.	5	At the mouth of the Colona river, wind became fresh from the e., with drizzling rain. At the Colon pier we encountered strong wind; cyclone making sign of approach.
8...	Noon.....	29.84	78.8	e. to ene.	5	Sky covered with a veil of cirrus, stratus, and nimbus; weather misty.
8...	3.00 p. m.	29.82	69.8	e. to ene.	5	Raining in torrents.
8...	4.00 p. m.	29.80	77.0	e.	Heavy gusts.	Continued heavy squalls.
8...	5.00 p. m.	29.76	77.0	e. to ese.	Very h'y gusts.	Very threatening; the awning carried away.
8...	6.00 p. m.	.....	.....	se.	Very h'y squall.	The sea rose nine feet above its ordinary height; the pier to which the steamer was moored gave way, and the irresistible force of the wind caused the vessel to drag. The steamer was in danger of being totally wrecked.
8...	10.00 p. m.	29.72	.....	.....	.....	
8...	Midnight.	29.65	.....	s.	Irresistible squalls.	
9...	1.00 a. m.	29.61	.....	s.	Gusts.	Wind decreasing in strength at intervals.
9...	.00 a. m.	29.59	.....	s. to sw.	Calm.	Lightning seen and distant thunder heard; the sea fell and wind became variable from s. to sw.
9...	6.00 a. m.	29.61	78.8	sw.	2	Cirrus and nimbus clouds.
9...	8.00 a. m.	29.69	80.6	sw.	2	Weather improving.
9...	Noon.....	29.78	82.4	sw.	2	Light cirrus; horizon misty.
9...	3.00 p. m.	29.82	84.2	sw.	2	Wind variable.
9...	6.00 p. m.	29.86	82.4	sw	2	Lightly covered.

Captain Lleonard says: "Not having an anemometer to measure the velocity of the wind, I think I may estimate it, without exaggeration, to have been 12 in force (Beaufort scale)."

DISTRICT OF SAN CAYETANO, PROVINCE OF HAVANA, CUBA.

Record of observations taken during the hurricane felt at this port on October 8 and 9:

Date.	Time.	Barometer (aneroid).	Thermometer.	Wind.	Force.
			°		
Oct. 8.....	1 p. m.	29.72	77.0	e.	2
8.....	2 p. m.	29.69	77.0	e.	2
8.....	3 p. m.	29.61	77.0	e.	2
8.....	4 p. m.	29.51	77.0	e.	2
8.....	5 p. m.	29.57	78.8	e.	3
8.....	6 p. m.	29.50	78.8	e.	3
8	7 p. m.	29.49	78.8	e.	4
8.....	8 p. m.	29.41	78.8	e.	4
8.....	9 p. m.	29.33	78.8	e.	4
8.....	10 p. m.	29.17	78.8	se.	4
8.....	11 p. m.	29.06	78.8	se.	4
8.....	Midnight.	28.98	78.8	sse.	4
9.....	1 a. m.	29.06	80.6	s.	4
9.....	2 a. m.	29.25	80.6	ssw.	4
9.....	3 a. m.	29.29	80.6	ssw.	4
9.....	4 a. m.	29.33	80.6	ssw.	4
9.....	5 a. m.	29.33	80.6	ssw.	4
9.....	6 a. m.	29.31	80.6	sw.	3
9.....	7 a. m.	29.41	80.6	sw.	3
9.....	8 a. m.	29.41	80.6	sw.	3
9.....	9 a. m.	29.45	80.6	sw.	3
9.....	10 a. m.	29.49	80.6	sw.	3
9.....	11 a. m.	29.53	80.6	sw.	2
9.....	Noon.....	29.57	80.6	sw.	2
9.....	1 p. m.	29.61	82.4	sw.	2
9.....	2 p. m.	29.65	82.4	sw.	2
9.....	3 p. m.	29.69	82.4	sw.	2
9.....	4 p. m.	29.72	82.4	sw.	2
9.....	5 p. m.	29.76	82.4	sw.	2
9.....	6 p. m.	29.76	82.4	sw.	2
9.....	7 p. m.	29.80	82.4	sw.	2
9.....	8 p. m.	29.80	82.4	sw.	2
9.....	9 p. m.	29.84	82.4	sw.	2
9.....	10 p. m.	29.88	82.4	sw.	2
9.....	11 p. m.	29.92	82.4	sw.	2
9.....	Midnight.	29.92	82.4	sw.	2

According to information received, much damage was done in the districts of Vinales, Ceja Ana de Luna, and Ceja del Rio. Many tobacco warehouses and large tracts of country were flooded, and a great number of trees were uprooted.

Observations taken at Belen College, Havana, Cuba, October 7, 8, and 9, 1882.

Date.	Time.	Barometer.	Thermometer.	Wind.	Velocity in miles per hour.	Remarks.
			°			
Oct. 7...	4.00 a. m.	29.88	74.5	e.	6.7	Cirro-cumulus, cirrus, and stratus; a band stretching from nne. to wsw., 4.
7...	5.00 a. m.	29.90	74.5	e.	7.8	Cirro-stratus, stratus, and cumulus, 10.
7...	6.00 a. m.	29.94	75.7	ese.	7.8	White cirro-cumulus, and other low and gray cumulus and stratus, 9.
7...	6.38 a. m.	29.91	76.1	ese.	9.4	Cirro-cumulus, stratus, and cumulus, 8.
7...	7.00 a. m.	29.92	75.7	e.	5.6	Cirro-stratus, cirro-cumulus, and stratus, 9.
7...	8.00 a. m.	29.93	77.2	e.¼se.	5.6	Cirro-cumulus, cirro-stratus, and cumulus in the n., 5.
7...	9.00 a. m.	29.93	80.1	ese.	10.1	Cirro-cumulus to stratus; rapid cumulus, 7.
7...	10.00 a. m.	29.93	82.8	se.¼e.	19.0	Rapid cirro-cumulus and cumulus, 9; gusts of 22 miles.
7...	11.00 a. m.	29.92	84.3	se.	15.7	Cirro-cumulus and cumulus, 9.
7...	Noon.	29.90	84.7	ese.	17.9	Almost covered with cirro-cumulus and cumulus, 10.
7...	1.00 p. m.	29.87	86.2	e.¼se.	11.2	Low and rapid cumulo-stratus, 10; gusts of 18 miles.
7...	2.00 p. m.	29.85	84.6	se.¼e.	17.9	Cumulus and cirro-cumulus, low cumulo-stratus from ssw. to sw., 10.
7...	3.00 p. m.	29.85	84.6	se.¼e.	11.2	Low cumulo-stratus, 10; gusts of 17 miles.
7...	4.00 p. m.	29.84	83.8	ese.	10.0	Misty at 3.30 p.m.; cirro-cumulus, cirrus, and cirro-stratus, rapid cumulus from sw., 10.
7...	5.00 p. m.	29.85	82.2	e.	11.2	Low cumulo-stratus, cirro-cumulus.
7...	6.00 p. m.	29.86	80.2	e.	8.9	At sunset, fragments of rainbow, the sky reddish.
7...	7.00 p. m.	29.87	81.1	e.¼se.	8.9	Covered, gloomy, 10.
7...	8.00 p. m.	29.85	78.8	e.½ne.	6.7	Covered, nimbus, 10.
7...	9.00 p. m.	29.87	78.3	e.¼se.	4.5	Stratus and cirrus, 10.
7...	10.00 p. m.	29.86	77.9	e.	8.9	Stratus turning into cumulus and stratus; very cloudy, 10.
8...	4.00 a. m.	29.79	77.2	e.¼se.	7.8	Covered, cumulo-stratus to stratus, 10.
8...	5.00 a. m.	29.79	77.2	ene.	7.8	Do.
8...	6.00 a. m.	29.81	77.4	ese.	8.9	Covered, nimbus, light mist, rapid cumulus in nne, 10.
8...	6.38 a. m.	29.81	77.2	e.	9.4	Covered, rapid cumulus in n., 10.
8...	7.00 a. m.	29.82	77.4	ese.	10.0	Covered, misty, with constant cumulus in n. and nw., 10.

Observations taken at Belen College, Havana, Cuba, October 7, 8, and 9, 1882—Continued.

Date.	Time.	Barometer.	Thermometer.	Wind.	Velocity in miles per hour.	Remarks.
			°			
8...	8.00 a. m.	29.80	77.4	ese.	14.5	Covered, misty, with constant cumulus in n. and nw., 10.
8...	9.00 a. m.	29.81	77.0	ese.	12.3	Covered, misty, 10.
8...	10.00 a. m.	29.84	77.7	e.¼se.	8.8	Covered, squally; cumulus rose in se., 10.
8...	11.00 a. m.	29.81	78.3	ese.	14.5	Covered, squally; gusts of 22 miles per hour.
8...	Noon.	29.79	78.4	e.¼se.	22.3	Covered, squally; gusts of 24 miles per hour.
8...	1.00 p. m.	29.74	79.0	e.¼se.	11.2	Covered, squally; gusts of 18 miles per hour.
8...	2.00 p. m.	29.72	78.8	e.	20.1	Covered.
8...	3.00 p. m.	29.71	78.6	ese.	20.1	Stratus from se.; rain in se.; light squall.
8...	4.00 p. m.	29.69	77.5	e.	17.9	Covered, swift cumulo-stratus low in s. and se.; squally.
8...	5.00 p. m.	29.71	77.7	e.¼se.	17.9	Stratus, rain in s. to se.
8...	6.00 p. m.	29.71	77.7	e.¼se.	17.9	Light squalls, steady cirro-cumulus; gusts of 29 miles per hour.
8...	7.00 p. m.	29.69	75.7	e.	13.4	Heavy squalls at 7.16 p. m., lightning in se.; gusts of 31 miles per hour.
8...	8.00 p. m.	29.71	76.5	e.¼ne.	17.9	Covered, nimbus; continuous squalls at 8.30; heavy squall, 22 miles.
8...	9.00 p. m.	29.72	77.2	e.¼se.	21.3	Continuous squalls, lightning in sw.
8...	10.00 p. m.	29.71	76.3	e.	15.7	Heavy squalls, steady nimbus at 9.30, p.m.
8...	10.30 p. m.	29.71	.....	se.¼e.	23.5	At 10.15 and 10.45 p. m. heavy squalls; gusts of 49 miles per hour.
8...	11.00 p. m.	29.71	.....	se.	31.3	Violent wind gusts from ese. and e. at 11.15, without rain.
8...	11.30 p. m.	29.70	.....	ese.	16.8	11.34 p. m., light rain began.
8...	Midnight.	29.69	.....	ese.	17.9	Misty; heavy wind gusts at 12.10 a. m.; lightning in s. and sw.
9...	12.30 a. m.	29.66	.....	se.	16.8	Light cumulus without rain.
9...	1.00 a. m.	29.67	78.1	se.¼e.	24.6	Rapid cumulus; sudden squalls of wind and rain; lightning at 1.26 a. m.; gusts of 40 miles.
9...	1.30 a. m.	29.65	.....	se.¼s.	23.5	Cirro-cumulus moving rapidly; lightning in sse; gusts of 33 miles.
9...	2.00 a. m.	29.64	.....	sse.	25.7	Rapid stratus and cumulus, lightning in e., misty; at 2.15 a. m.; gusts of 49 miles.
9...	2.30 a. m.	29.64	79.2	sse.	17.9	Lightning in e.; gusts of 40 miles.
9...	3.30 a. m.	29.63	.....	sse.	23.5	Heavy squall, 44 miles.
9...	4.00 a. m.	29.65	79.9	sse.	22.4	Squally, strong, sudden gusts of wind; low cumulus.
9...	4.30 a. m.	29.65	.....	sse.	28.0	Sudden gusts from se. and ese.; the whole horizon very gloomy.
9...	5.00 a. m.	29.64	.....	sse.	26.8	Rapid cumulus and stratus; at 5.20 a. m. the wind changed to sw.; gusts of 35 miles.
9...	5.30 a. m.	29.68	79.2	s.¼se.	20.1	Low cumulo-stratus.
9...	6.00 a. m.	29.69	78.2	se.¼s.	24.6	The aspect bad in sw. and wsw.
9...	6.38 a. m.	29.70	80.8	sse.	23.7	Wind veering to e.: rain began 6.38 a. m.
9...	7.00 a. m.	29.71	78.8	s.	22.4	Raining in ssw.
9...	8.00 a. m.	29.74	79.5	s.	22.4	Covered; nimbus; wind squally, shifting from sw. and w.; misty.
9...	9.00 a. m.	29.75	79.9	s.	23.5	Rapid cumulus; 9.32, a. m.; squalls of 31 miles velocity.
9...	10.00 a. m.	29.76	80.8	s.	24.6	10.33, a. m.; heavy squalls of short duration, 33 miles.
9...	11.00 a. m.	29.76	82.2	s.	24.6	Rapid and low cumulo-stratus and high cumulus.
9...	Noon.	29.76	82.9	s.	20.1	Upper clouds moving very rapidly.
9...	1.00 p. m.	29.76	83.5	s.	24.5	12 08 p. m., squally, with sudden gusts of 31 miles.
9...	2.00 p. m.	29.74	83.5	s.	22.4	Very rapid and low cumulus, dense cirro-cumulus.
9...	3.00 p. m.	29.75	82.9	s.	22.4	Cumulo-stratus to stratus; stratus and cumulo-stratus low in the sw.
9...	4.00 p. m.	29.76	82.2	s.	17.9	Cirro-stratus, cumulus and cumulo-stratus.
9...	5.00 p. m.	29.78	81.1	s.	13.4	Cumulus, cumulo-stratus and dense cirro-cumulus from nw.
9...	6.00 p. m.	29.80	80.1	s.	14.5	Low and rapid cirro-stratus; cumulus; sunset reddish.
9...	7.00 p. m.	29.82	80.1	s.	12.3	Stratus and lightning in the nw.
9...	8.00 p. m.	29.85	79.5	s.¼sw.	6.7	At 7.45 p. m., squally and misty, wind s. and sw., very gloomy.
9...	9.00 p. m.	29.86	79.2	s.¼sw.	6.8	Cumulus and stratus.
9...	10.00 p. m.	29.86	79.0	s.¼sw.	8.9	Do.

At 9.30 a. m. of the 9th, a southeast gale and heavy rain were felt at Key West, where signals were flying. Cautionary signals were immediately ordered at all stations from New York City south, and the observers were warned of the approach of the dangerous storm.

The following special warning was sent at 12 m. to the secretary of the Maritime Exchange, New York City: "East to south gales continue in southern Florida. Cyclone central in east Gulf, southeast of Pensacola, moving northward."

The gale continued all day, at Key West, on the 9th and 10th.

On the 10th, the storm was felt at Jacksonville, the wind reaching a velocity of forty-four miles an hour. Signals had been displayed at this place for thirty hours before the storm appeared. The centre of the cyclone at 7 a. m. was south and west of Cedar Keys.

The gale began at Cedar Keys about 4 a. m. of the 10th, though the approach of the cyclone was felt on the 9th; the wind, accompanied by rain, blew briskly from the ne. The wind, on the morning of the 10th, veered from ne. to e., steadily and gradually shifting during the day to se. and s., increasing in force until it attained a velocity of fifty-six miles. This greatly alarmed the residents, who feared that the tide would again inundate the streets and repeat the damage done by the September cyclone. During the night of the 10th, the water reached its highest point, flooding all the lower part of the town, washing away great quantities of logs, timbers, etc. The gale ended about 9 a. m. on the 11th, the wind veering to nw. The centre passed over the northern part of Florida, and by the morning of the 11th, was in southeastern Georgia.

At 1 a. m. of the 11th, the following telegram was sent to the Maritime Association, New York City: "Cyclone has moved to northern Florida, having lost much of its energy, but the indications are that it will move northeastward along the Atlantic coast, accompanied by dangerous easterly winds off the coast."

At 10 a. m., same date, the following was sent to the assotiation: "The cyclone has increased in energy. It is now cencral in northern Florida. Southeast gales are reported near Jacksonville. Barometer 29.55. It is not safe for vessels to sail for southern ports."

At 5.30 p. m., the following was sent to the observers at Boston, New York City, Philadelphia, Baltimore, and Norfolk: "Communicate with captains of vessels and shipmasters. Give warning it is not safe to leave port. Cyclone is central near Savannah, moving slowly northeast. Violent gales are reported on the south Atlantic coast."

On the afternoon of the 11th, the centre of the cyclone was near Savannah. Signals had been displayed there for sixteen hours before the storm appeared. The wind blew at Charleston, forty miles and at Savannah, thirty-eight miles per hour.

The storm continued up the Atlantic coast, following the trend of the shore, and finally passed off to the east of Cape Hatteras on the 12th. Signals were displayed at all ports as far north as Boston, and at all these places a very severe northeast gale blew, the velocity of the wind ranging from twelve to forty-two miles an hour.

The following is a brief synopsis of reports received from stations in the United States lying within or near the track of the cyclone:

Key West.—From 4.30 to 10 a. m. of the 9th, the barometer rose slightly, and from 10 to 12.30 p. m. fell .05 inch; after 12.30 it rose steadily. The storm began at 4 a. m. and ended at 10.30 p. m. The wind veered from se. to s. between 1 and 1.30 p. m. The schooner "O. M. Remington," from Ruatan, Bay Islands, Honduras, to Philadelphia, arrived at Key West on the night of the 9th, and reported having encountered the cyclone in latitude N. 23° 30′ and longitude W. 84°, on the night of the 7th. She experienced high east winds and had her jibboom, bowsprit and sails carried away. The vessel was badly strained and leaking. The brig "Emily T. Sheldon," from New York to Galveston, encountered the storm on the morning of the 8th, in latitude 23° 40′ N., and longitude 82° 30′ W. She experienced high se. to sw. winds, and lost her mainmast and sails. The Norwegian bark "Plimsoll" experienced high easterly winds, on the morning of the 8th, in latitude 23° 40′ N., and longitude 83° 40′ W. At noon came a calm, lasting for three hours, when the wind changed to w. and blew with great violence for two hours. It then backed to sw. and moderated. The vessel had her sails and bulwarks blown away and her topmast broken during the gale.

Punta Rassa.—The barometer fell steadily on the 9th, until 6 p. m., when it read 29.65, after which it rose. Brisk easterly winds prevailed till about 7.30 p. m., when the wind veered to se. and continued with increasing force up to midnight; it then shifted to s., reaching the maximum velocity of forty-two miles at 11.35 p. m. After midnight the wind veered to sw.

and blew with diminished force. The barometer rose slowly during the 10th.

Cedar Keys.—The storm raged with violence, accompanied by very heavy rains, on the 10th. The telegraph line was blown down and the railroad trestle was washed away, causing delay of trains. The storm continued until the morning of the 11th. The maximum velocity recorded was fifty-two miles.

Charleston.—Rainy and stormy during the whole day of the 11th. There was very heavy rain with high ne. gale. Fences, chimneys and trees were blown down. The schooner "Maggie J. Lawrence" encountered the storm when she was about fifteen miles from Charleston; she lost all her sails.

Cape Lookout.—At 10 a. m. of the 11th, the wind backed to ne. and increased in velocity, blowing with terrible force during the day, while rain continued without cessation.

The following table has been prepared showing the property detained in port by the signals:

Property detained in port during October cyclone.

Port.	Number and description of vessels.	Value of vessel.	Value of cargo.	Total value.
Provincetown, Mass.	200 schooners			$1,000,000
New London, Conn.	3 coast survey schooners			
	1 United States steamer			
	1 steam-tug and 4 barges			60,000
	1 steam-tug and 3 barges			35,000
	1 steam-tug and 2 barges			25,000
	1 steam-tug and 2 barges			20,000
	1 steam-tug			10,000
	1 steam-tug			15,000
	1 steam-tug and 4 barges			60,000
	2 barges (*a*)			
	3 brigs (*a*)			
	5 schooners (*a*)			
	Schooner			20,000
	Schooner			20,000
	Schooner			35,000
	Schooner smack			1,500
	Schooner smack			2,000
	Schooner smack			1,500
	Schooner smack			1,500
	Schooner smack			2,000
	Schooner smack			2,000
	Schooner smack			2,000
	Schooner smack			10,000
	Steam yacht			40,000
	Schooner yacht			20,000
	Schooner yacht			15,000
	Schooner yacht			25,000
	Schooner yacht			15,000
	Sloop yacht			12,000
New Haven, Conn.	9 steamers and 40 sailing vessels			420,0 0
Wilmington, N. C.	Schooner	$16,000	$3,800	19,800
Smithville, N. C.	Bark	20,000	19,000	39,000
	Bark	16,000	7,000	23,000
	Steamer	12,000	50,000	62,000
	Brig	6,000	9,000	15,000
	Brig	8,000	7,000	15,000
Savannah, Ga.	Steamship	265,000	190,000	455,000
	Bark	25,000	4,500	29,500
	Brig	20,000	3,500	23,500
	Schooner	15,000	4,200	19,200
	Bark	16,000	4,500	20,500
	Brig	16,000	10,000	26,000
	Schooner	10,000	1,063	11,063
Norfolk, Va., *b*	Three-masted schooner			40,000
	Three-masted schooner			40,000
	Two-masted schooner			5,000
	Fishing steamer			8,000
Charleston, S. C.	Schooner	12,000	4,900	16,900
	Schooner	16,000	6,790	22,790
Newport, R. I.	Schooner	10,000	3,000	13,000
	Schooner	12,000	1,500	13,500
	Schooner	12,000		12,000
	Schooner	5,000		5,000
	Schooner	5,000		5,000
	Steamer	11,000		11,000
	Schooner yacht	75,000		75,000
	Schooner yacht	75,000		75,000
Block Island, R. I.	60 fishing smacks	15,000		15,000
Key West, Fla.	Steamer	125,000	150,000	275,000
Cedar Keys, Fla.	Steamer	26,000		26,000
	Brig	12,000	2,500	14,500
	Schooner	18,000	2,500	20,500
Jacksonville, Fla.	Schooner	20,000	4,000	24,000
	Schooner	12,000	2,800	14,800
	Schooner	15,000	4,000	19,000
Fort George Island, Fla.	Schooner	25,000	4,200	29,200
	Schooner	15,000	5,140	20,140
	Schooner	20,000	4,600	24,600
	Schooner	15,000	2,900	17,900
	Schooner	12,000	2,400	14,400
	Schooner	15,000	4,800	19,800
	Schooner	12,000	4,000	16,000
	Schooner	20,000	4,800	24,800
	Schooner	25,000	5,000	30,000
	Schooner	15,000	3,400	18,400
	Schooner	25,000	4,600	29,600
	Schooner	30,000	5,500	35,500
	Schooner	20,000	5,600	25,600
	Schooner	20,000	4,800	24,800

Property detained in port during October cyclone—Continued.

Port.	Number and description of vessels.	Value of vessel.	Value of cargo.	Total value.
Fort George Island, Fla. (*Continued.*)	Schooner	30,000	4,800	34,800
	Schooner	30,000	4,800	34,800
	Schooner	3,000	2,000	5,000
Fernandina, Fla.	Schooner	25,000	5,000	30,000
	Schooner	20,000	4,000	24,000
Baltimore, Md., *c*	1 brig			35,000
	1 brig			38,500
	1 brig			55,000
	1 brig			60,000
Delaware Breakwater, Del.	1 steamer	60,000	17,000	77,000
	1 ship	50,000	Ballast	50,000
	3 barks	90,000	125,000	215,000
	1 brig	20,000	15,000	35,000
	50 schooners	600,000	100,000	700,000
	12 schooners	120,000	32,000	152,000
	10 schooners	115,000	Ballast	115,000
	1 schooner	17,000	10,000	27,000
Cape Lookout, N. C.	3 sloop yachts			6,000
	1 smack			1,500
	2 schooners			3,000
	1 weir net			2,500
	1 steamer			3,000
	Fishing outfit			500
Total				6,051,393

a Anchored in lower harbor; value could not be ascertained.

b A large number of vessels were detained at Hampton Roads, of which the observer was unable to obtain names, cargoes, or values. Other vessels detained at the port sailed before the receipt of instructions to gather statistics.

c A large number of vessels were detained in lower harbor.

The report of the observer at New York is very interesting, although it was impossible for him to obtain statistics of the value of the property detained from going into the cyclone. One brig, two barks, and one hundred and forty schooners anchored at Hell Gate. These were mostly coasters, but $900,000 is a very low estimate of their value, without considering their cargoes. The larger vessels anchored in "the narrows," and it is estimated that, besides several steamers, there were two hundred ships, barks, and brigs, and one hundred and fifty schooners, all worth at least from $8,000,000 to $10,000,000. The observer, who had the assistance of the secretary of the New York Maritime Association, estimates that many millions of property was saved from jeopardy by observing the warnings. The experience of the September cyclone impelled ship-masters to pay unusual heed to the signals. The storm, outside the harbor, was of great severity. The captains of the Long Island Sound steamers report it "the severest on record;" they were compelled to seek harbor. Three coastwise steamers that put to sea were obliged to return to port, and the only sailing vessel, a brig, that sailed in disregard of the signals, between the 11th and 13th, was forced back. When the storm was over, and the signals were lowered, so many vessels left the harbor together that people went to see them sail. The beautiful and unusual sight was described in the daily newspapers; the "Telegram" stating that fifteen steamers and two hundred sailing vessels passed through "the narrows" on the 14th.

This cyclone undoubtedly formed in the Caribbean sea, south of Grand Cayman Island, and recurved over the western part of Cuba. It has been traced, as far as possible, after leaving the coast of America, over the Atlantic by the following reports, furnished through the co-operation of the marine observers of the Signal Service, and of the "New York Herald" weather service: 14th, s. s. "City of Alexandria," in N. 35° 36′, W. 75° 13′, wind nnw., force 6, overcast, light rain. 15th, bark "Julia H.," in N. 38° 6′, W. 65° 23′, wind se., force 10. On the 13th, 14th, and 15th, numerous vessels, near N. 45°, W. 45°, reported strong nw. and wnw. gales and rain. The brig "Teresina," which left Philadelphia for Oporto on October 3, reported: 16th, heavy nne. to ne. gale, several sails carried away, bulwarks stove, and vessel much damaged. 17th, s. s. "Bohemian," in N. 48° 48′, W. 46° 08′, nw. gale, very high sea; s. s. "Britannic," in N. 48° 25′, W. 40° 34′, strong nw. wind to fresh gale. On the 18th, the storm-centre was probably between W. 35° and W. 25°. The s. s. "Gallia," in N. 50° 16′, W. 24° 8′, reported, on the 17th, lowest barometer, reading 28.75, wind veered to squalls from s. to e., ne. and nw., and blew a perfect gale for several hours. On the 18th

the same vessel, in N. 49° 06′, W. 30° 39′, encountered nw. gale, force 9. On the same day, the s. s. "Arizona," near N. 50°, W. 30′, reported barometer 29.15; wind suddenly shifted from s. by w., force 3, to n. by w., force 9, with high cross sea, one sea coming from the west, and another from the north. The gale lasted about fourteen hours, with very hard squalls.

Captain C. Ludwig, commanding the s. s. "Westphalia," furnishes the following: 17th, in N. 50° 57′, W. 24° 50′, barometer 29.19, falling; the wind went slowly but steadily to south, and, between noon and 4 p. m., it passed through east to north, slowly increasing, and accompanied by heavy rains. At 4 p. m., the barometer read 28.78, and between 5 and 6 p. m. the gale broke suddenly out from the nw., force 11; at the same time the sea-swell rose from moderate to very heavy. The gale continued, with very high sea and rain, and totally clouded sky, until 10 p. m. After that hour the sky began to clear, while the wind increased to force 10, at 11 p. m. At midnight, the barometer began to rise, but very heavy squalls of force 11, continued, without rain, until 4 a. m. of the 18th. The s. s. "Colima," in N. 52° 12′, W. 28° 11′, reported: 9.30 p. m., barometer 28.74, wind n. ½ e., force 11, with heavy rain; at 10 p. m., wind ne. by n., force 12, raining, barometer 28.55. On the 19th, 4 a. m., barometer 28.46, wind nw.; force 10.

VII.—This depression formed in western Nebraska, on the 11th, and pursued rather an erratic course. At first the movement was to the northeast, changing to the northwest, and recurving, on the 12th, west of Manitoba; after this, its course was about east-southeast. On the morning of the 13th, the centre was north of Lake Superior. During the afternoon, the course was again changed. It now began to move toward the northeast, and passed the limits of observation. The lowest pressure observed was 29.23, on the 12th, at Fort Garry, Manitoba. At nearly every station in the upper lake region, the wind reached a velocity of more than twenty-five miles. Rain fell, during its passage, in Montana, Dakota, the Missouri and Mississippi valleys, and the lake region.

VIII.—This depression made its appearance in Colorado, on the 14th, and moving in a direction nearly northeasterly, passed into British America, on the 15th. The lowest pressure observed was 29.34, at Fort Garry, Manitoba, on the 15th.

IX.—On the morning of the 19th, the reports showed that a depression was moving across British America, the centre at that time being some distance north of Montana. By the 20th, it had disappeared. The disturbance was so slightly felt in the United States that a description is considered unnecessary.

X.—On the morning of the 21st, a sharp fall occurred in Dakota. The depression thus formed, moved in a direction north of east; the centre passed over Minnesota, Lake Superior, and Canada, and disappeared, on the 23d. Rain occurred in the northern Mississippi valley, the lake region, and the New England states. The lowest observed pressure was 29.70, at Escanaba, on the 22d. The wind reached a velocity of more than twenty-five miles at Duluth, Minnesota, Marquette and Escanaba, Michigan.

XI.—This depression formed in British America, north of Montana, and was first noted on the morning of the 24th. The movement was to the southeast till midnight, the centre then being at Duluth, Minnesota. From this point the course was to the north of east. Following the Saint Lawrence river, it passed into the Atlantic, on the 26th. The lowest observed pressure was 29.24, at Sydney, Cape Breton Island, on the 25th. Light rains occurred in Canada and the New England states.

XII.—This area made its appearance on the coast of British Columbia, on the 26th. The centre moved across British America, pursuing an easterly course, and passed into the Atlantic, on the 30th. The lowest pressure observed was 29.40, at Fort Garry, Manitoba, on the 27th.

XIII.—This depression was first noted in Montana, on the 29th, though it is evident that a disturbance existed in British Columbia, on the 28th. The movement was southerly until the morning of the 30th, the centre then being in southern Dakota. The course changed to the northeast, and the last trace had of it was at Cape Rozier, province of Quebec, on the 31st. The lowest observed pressure was 29.40, at Marquette, Michigan, on the 30th. Light rains occurred in Montana, Dakota, the Missouri and Mississippi valleys, the lake region, and the New England states.

INTERNATIONAL METEOROLOGY.

International charts iv. and v. accompany the present number of this REVIEW. Chart iv. is published for August, 1880, and continues the series of that chart begun in January, 1877. Chart v. is prepared for November, 1880, and continues the series of that chart begun November, 1877. For the description of these charts, much valuable information has been obtained from the "Monatliche Uebersicht der Witterung," published by Professor Dr. G. Neumayer, Director of the German Marine Observatory at Hamburg, and from the "Bulletin Mensuel," published by Mr. Marc Dechrevens, of Zi-Ka-Wei, China.

Chart iv. exhibits the mean pressure, mean temperature, and the prevailing direction of the wind over the northern hemisphere, and at certain isolated stations in the southern hemisphere, as determined from one observation taken each day at 7:35 a. m. Washington, or 0.43 p. m. Greenwich mean time.

The mean pressure is lowest over the continent of Asia, where it ranges from 29.50 (749.3) over British India, to 29.80 (756.9) in Siberia, and in China and Japan.

An area of low-pressure, 29.80 (756.9), occupies Iceland, and extends, with decreasing pressure, westward over Greenland, where the mean pressure for the month is 29.58 (751.3) at Godthaab.

The isobar of 29.90 (759.4) covers the Gulf of Saint Lawrence, and extends northeastward, over the ocean, to the extreme northern limits of Scandinavia; it then trends southwestward and occupies southeastern Europe.

The area of highest mean pressure 30.20 (767.1) is shown over the Azores, while high-pressures, 30.00 (762.0) to 30.10 (764.5), occupy the North American continent, the Atlantic ocean and western Europe. In the United States, the area of barometric maxima covers the north Pacific coast, where the mean pressure ranges from 30.00 (762.0) to 30.06 (763.5).

Compared with the preceding month (July), the mean atmospheric pressure has increased over the United States, except in southern California and the Florida peninsula, where a slight decrease has occurred. In Canada, there is a general increase of pressure throughout the Dominion.

In Europe, the mean barometric pressure has increased considerably in the northern and northwestern parts of the continent; the largest increase appears over the British Isles and the Scandinavian peninsula.

In central Europe, the pressure has remained unchanged, and in the southern peninsulas, a slight decrease is shown.

In Greenland, the pressure has materially decreased, the mean pressure at Godthaab being .23 inch below that of July, 1880.

In Morocco, Algeria, and Tunis, the pressure has decreased about .05 inch.

In Asia, the changes are unimportant, except over the region lying north of the fiftieth parallel, where there is an increase of .07 inch.

Compared with the corresponding month of previous years, the mean pressure is above the normal along the Atlantic coast of the United States, and westward to the eighty-fifth meridian. In the interior, the Florida peninsula, and over the Gulf of Mexico, the pressure is below the normal, the greatest deficiency, .07 inch, being reported from Florida. In Canada, the pressure is above the normal.

The following table shows the mean pressure and mean temperature, with corresponding departures, for the month of August, 1880, in the several countries of Europe and Asia, compared with the means as determined from observations taken during the years 1877, 1878, and 1879: